

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
19 August 2004 (19.08.2004)

PCT

(10) International Publication Number
WO 2004/069583 A3

(51) International Patent Classification⁷: **B60N 2/68**,
G01M 17/007, 19/00, G06F 17/50

(21) International Application Number:
PCT/US2004/002952

(22) International Filing Date: 3 February 2004 (03.02.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/444,534 3 February 2003 (03.02.2003) US

(71) Applicant (for all designated States except US): **INTIER
AUTOMOTIVE INC** [US/US]; 337 Magna Drive, Au-
rora, Ontario L4G 7K1 (CA).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **REED, Steven**,
James [US/US]; 8835 McGregor Lane, Pinckney, MI

48169 (US). **MILOSIC, Mari, C.** [US/US]; 1383 Bed-
ford, Grosse Pointe Park, MI 48230 (US). **FURTADO,**
Roland [IN/US]; 19458 Silver Spring Drive Apt. #204,
Northville, MI 48167 (US).

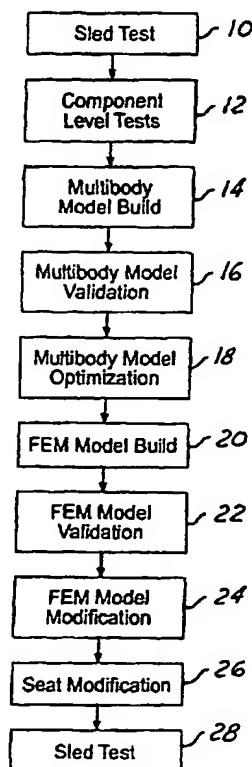
(74) Agents: **ASHER, Robin, W.** et al.; Clark Hill PLC, Suite
3500, 500 Woodward Avenue, Detroit, MI 48226-3435
(US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: METHOD OF DESIGNING AUTOMOTIVE SEAT ASSEMBLIES FOR REAR IMPACT PERFORMANCE



(57) Abstract: A method for designing automobile seat assemblies in which a sled test is run on a prototype seat assembly in order to obtain the necessary data to model the seat assembly with simulation software. A basic model of the surface of the seat assembly is built utilizing simulation software and tests are run on various parameters to determine those that are most significant to the desired objective of the design process. Thereafter, the software is used to build a detailed model of the seat assembly and all its elements and the significant parameters are tested further to determine those that are again most significant to achieving the desired outcome. Once optimization ranges for those most significant parameters are chosen, the prototype seat assembly is modified accordingly. A final sled test is run on the modified prototype to verify the results and compare those results with the original sled test results.

WO 2004/069583 A3



GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:

7 October 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/002952

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B60N2/68 G01M17/007 G01M19/00 G06F17/50

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B60N G01M G06F G06T

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 352 312 B1 (REES RICHARD W A) 5 March 2002 (2002-03-05) column 13, line 36 - line 45	1-16
X	EP 1 262 886 A (SUMITOMO RUBBER IND) 4 December 2002 (2002-12-04) figure 2	1-16
A	DE 202 10 946 U (TRW REPA GMBH) 21 November 2002 (2002-11-21) page 9, line 26 - page 10, line 6 figure 13	1,10
A	US 5 930 155 A (KUBO SUSUMU ET AL) 27 July 1999 (1999-07-27) figures 9,10	1,10
	----- -/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the international search

28 July 2004

Date of mailing of the international search report

05/08/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Cauderlier, F

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/002952

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 98/54663 A (SHIMMELL DENNIS S ; NELSON METAL PROD CORP (US)) 3 December 1998 (1998-12-03) figures 4,8</p> <p>-----</p>	1,10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

P/S2004/002952

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6352312	B1	05-03-2002	NONE	
EP 1262886	A	04-12-2002	JP 2002350294 A EP 1262886 A2 US 2002177976 A1	04-12-2002 04-12-2002 28-11-2002
DE 20210946	U	21-11-2002	DE 20210946 U1	21-11-2002
US 5930155	A	27-07-1999	JP 3224089 B2 JP 10267800 A	29-10-2001 09-10-1998
WO 9854663	A	03-12-1998	US 5956500 A BR 9804897 A CA 2253799 A1 EP 0916121 A1 JP 2000509180 T WO 9854663 A1	21-09-1999 18-01-2000 03-12-1998 19-05-1999 18-07-2000 03-12-1998